



## Note from the Editor

The purpose of this newsletter is to disseminate information about exploration, mapping, and science in Lechuguilla Cave. We hope to publish this newsletter three or four times a year to keep people up-to-date on what is going on.

If researchers or cavers would like to submit trip reports or other newsworthy items related to Lechuguilla to be used in this forum, please submit them to me in either text or Word format. Since this will be an all-electronic publication, we will be able to use color. You will need to limit your file size to less than 10MB unless you are submitting on a CD as our email system cannot handle larger files.

If you have suggestions or other things you would like to see in the publication feel free to let me know. This is a work in progress that I hope will be valuable to all cavers and scientists with an interest in Lechuguilla. I am also looking for good suggestions for a name for the publication.

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## 2004 Lechuguilla Cave Summary

*By Stan Allison*

### Summary

No major breakthroughs were made in Lechuguilla Cave during 2004. As of January 2004 the surveyed length was 111.92 miles long. By December the survey had grown to 114.08 miles in length. Over 2.16 miles of survey was performed and 0.87 miles of resurvey was done. The number of loop closures that exceeded 2 standard deviations remained at 267 but the percentage of these bad loops dropped from 14.2% to 13.5%. The overall standard deviation of the cave improved from 1.264 to 1.204. Much work has been accomplished in the past five years in fixing bad survey loops. Almost half (133) of the remaining bad survey loops are located in the near south. The near south has an overall standard deviation of 1.417. Another area that could use some work is the near east where there are only 47 bad surveys, but the standard deviation is 1.613 which is the worst of the 7 subdivisions. All survey and resurveys done in Lechuguilla Cave are required to have an inventory done in conjunction with survey and resurvey.

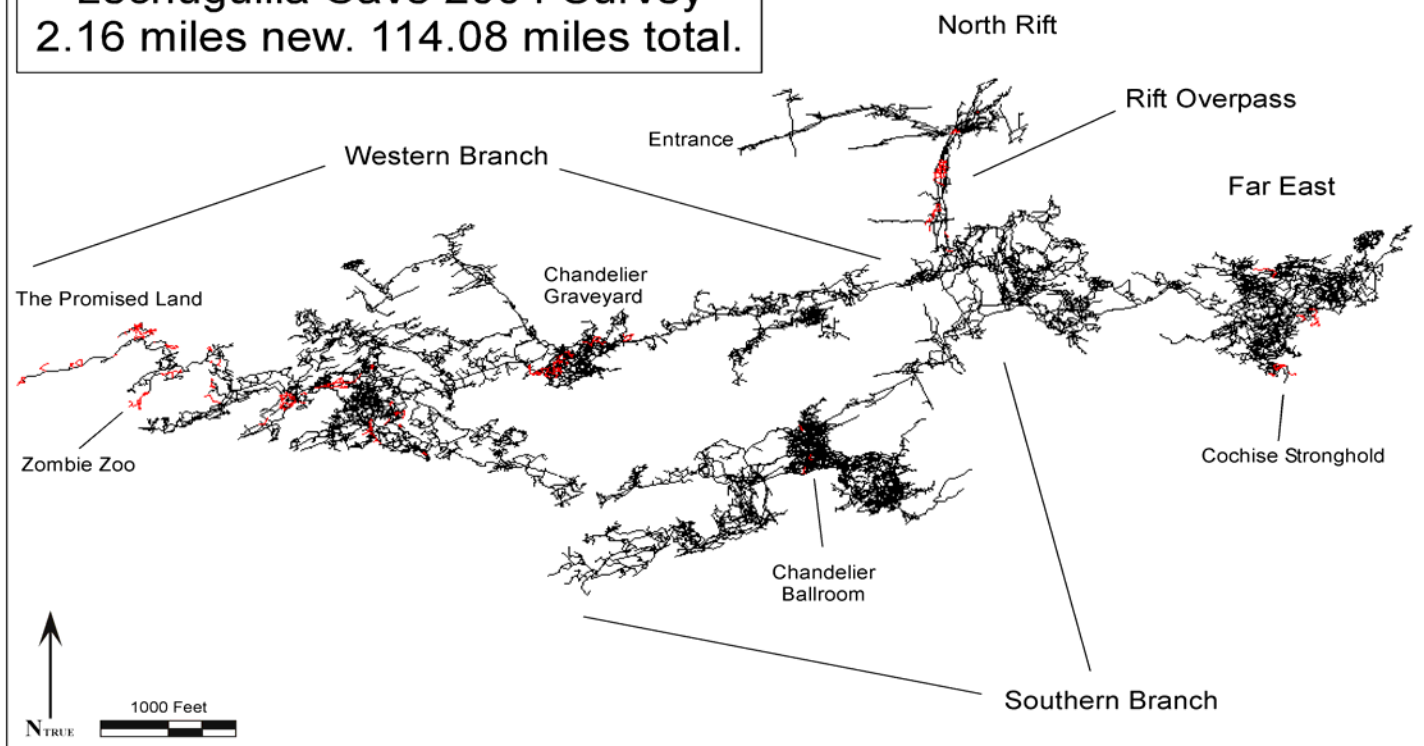
### Data Management

Two major changes were made in the way survey data and survey notes are managed in 2004. Since the Carlsbad Caverns National Park Survey Standards were established, backsight and foresight azimuth and inclination information have been collected. In the past only the foresight azimuth and inclination were entered into the computer survey data. As of this year both backsight and foresight information is being entered into all of the computer survey data. Another change is that we are now scanning all of the survey notes produced in Carlsbad Caverns National Park into Adobe Acrobat PDF files. Our goal is to eventually have all of the survey notes in the park in a digital format. This will make it much easier for researchers, surveyors, cartographers and explorers to utilize survey notes for their respective tasks.

### Big Sky Camp Water Source

April 11 was the first trip into Lechuguilla Cave for 2004 to replace the old Big Sky water source tube with a type of tube that would not support microbial growth. While

## Lechuguilla Cave 2004 Survey 2.16 miles new. 114.08 miles total.



Surveys done in 2004 shown in red. Map produced by Stan Allison using COMPASS and CANVAS software.

in the Land of the Awes area, a survey tie-in blunder related to there being two FFFB1 survey stations was corrected which fixed three of the worst survey loops in

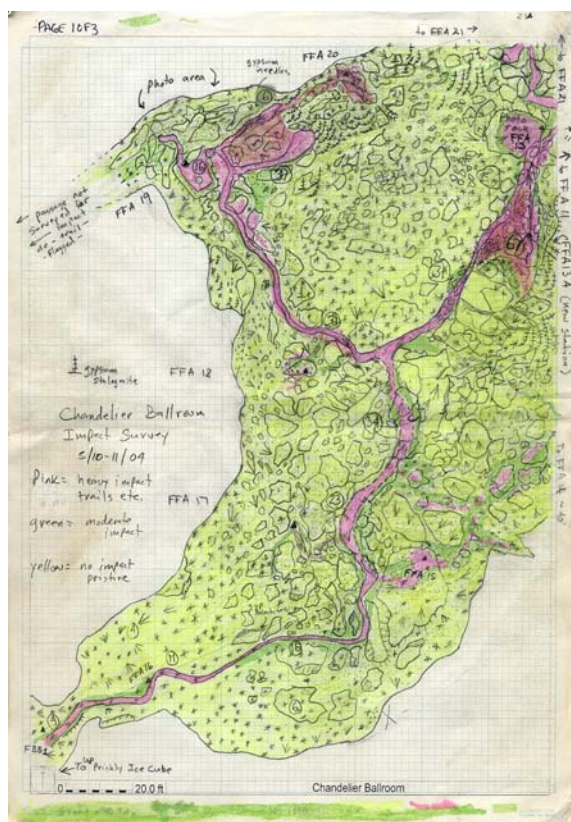
the near south. This day trip was made by Andy Armstrong, Bonny Armstrong and Stan Allison.

### Fortini-Miller Expedition (Promised Land)

Art Fortini and Ron Miller co-lead a trip to the Promised Land April 30-May 8. Trip participants were: Cathy Borer, Peter Bosted, Daniel Chailloux, John Lyles, Jed Mosenfelder and Carol Vesely. A total of 2,725.9 feet of new survey was produced during this trip. Most of the survey was completed in the Promised Land area with a minor amount in the Widowmaker area. Cathy Borer obtained corrosion residue samples for Doctor Diana Northup's research into the microbial activity of corrosion residue. Essentially all leads beyond the Nativity Chamber were explored to an end on this trip. The Nativity Chamber and Promised Land area require multiple gear changes to keep from tracking corrosion residue onto flowstone. Now that exploration is essentially completed, future traffic will be very limited.

### Chandelier Ballroom Impact Study

Ray Keeler led Mark Andrich, Chris Beauchamp, Gary Burns, Jansen Cardy and Bob Jacobs on an impact mapping trip to the Chandelier Ballroom from May 9-12. The purpose of this trip was to produce a detailed 20 feet per inch plan sketch of the Chandelier Ballroom indicating the visible human impacts in this room. They used pink to indicate heavy traffic, green to indicate



Chandelier Ballroom Impact Sketch. Note that the pink areas indicating heavy impact correspond to double lines indicating the flagged trails.





*Chromium paste? at EYE26A17C. Photo ©Dave Bunnell.*

moderate traffic and yellow to indicate no visible impact or pristine. The results of their impact map show that the flagged trails have been very effective in confining the majority of impact to the trails.

### **Barton Expedition (Chandelier Graveyard)**

Hazel Barton led Dave Bunnell, Greg Francek, Vivian Loftin, Pat Seiser and Eric Weaver on a May 10-16 trip to continue work on her Chandelier Graveyard quadrangle maps. 1,128.7 feet of new survey was accomplished along with 1,590 feet of resurvey. At survey station EYE26A17C they photographed a dark green paste on either white gypsum or calcite. This paste seems to resemble a Chromium compound that was previously only documented at survey station EJ11 by Harvey DuChene's mineral inventory. More work is needed to see if the two substances are indeed the same.

### **Trail Re-flagging**

Jennifer Foote led John Lyles, Mike Flores and Phyllis Boneau on two day trips July 31 and August 1. They removed the old trail flagging and replaced it with new trail flagging from the entrance to Apricot Pit. They observed that the water in Lake Lechuguilla had risen from -0.1 feet in July 13 to 4.66 feet on August 1<sup>st</sup>. This was the first of many interesting hydrologic observations made on what was an above average year for precipitation. Over twice the usual precipitation of 12 inches fell in 2004.

### **Reames Trips (North Rift)**

Steve Reames coordinated 3 day trips to work in the North Rift area to continue work on the quad map he is drawing for this area. On August 8, Steve Reames, Bruce Albright and Barbara Smith resketched CHA9-25 in the Corinthian Leather Hall. Meanwhile Paul Burger belayed Stuart Marlett on a climb above CHA10 that did not go.

On October 10 Steve Reames led Amy and Carl Bern, Tom Dotter and Jeff Goben to continue work on Reames North Rift Quad. Steve and Amy resketched and inventoried CHA25-33 and CHA25A-D. Tom, Carl and Jeff resurveyed in the CJA area.

### **Warner Expedition (Far East)**

Simeon Warner led John Lyles, Steven Maynard and Jim Goetz on a trip to the Far East from August 14-21. They resketched the main room of the La Morada Maze and then spent the rest of the week working in the Outback. Survey was done in the Mescalero Room, Cochise Stronghold and other areas. A total of 1,430.7 feet of new survey was accomplished with 220.7 feet of resurvey.

### **Addison Jones Expedition (Rift)**

On September 12, 14 and 16 Peter Jones and Aaron Addison co-led a series of day trips to the Rift and Rift Overpass. Trip participants were: Chris Andrews, Kelly Mathis, Travis Scott, Dan Legnini and Stan Allison. Though no major discoveries were made a total of 1,779.5 feet of new survey was done along with 306.1 feet of resurvey. Surprisingly, there is still more to survey in the Rift and Rift Overpass area.



*Mother Lode Photo © Dave Bunnell*

## **Rift Rope Replacement**

On September 24, Stan Allison, Pat Cicero and Aaron Stockton replaced all of the ropes in the Rift Overpass. They also fixed a blunder in the Rift Overpass area. Lake Lechuguilla was down to 3.27 feet.

## **Lake of the White Roses**

On October 16, Stan Allison, Pat Cicero and Aaron Stockton made a day trip down to the deep point at Lake of the White Roses to download data from the water level data logger that was installed in May of 2003. The Lost Pecos River was no longer running and the pool which it normally feeds was lower than it had been in the past. Lake of the White Roses which is thought to be the regional water table has dropped 15 feet since its discovery in 1989. The data from the data logger showed a 0.1 foot spike shortly after the major flooding of the Pecos River in April. What was more interesting was the spike that raised the water level almost a foot in the two weeks prior to this trip. It will be interesting to see how high the spike ultimately goes when the data is downloaded in the future (see accompanying science article for more).

## **Airlock Maintenance**

On October 22, Paul Burger and Stan Allison removed up to a foot of sediment that had washed into the entrance tube of the airlock. A french drain was installed at the entrance of the airlock to allow sediment to drain away from the airlock in the future. Over an inch of water was present in the airlock and this was bailed out and the airlock cleaned.

## **Pre-Rescue Plans**

John Punches and Anmar Mirza led an effort to produce rescue pre-plans for the main travel routes in Lechuguilla Cave from October 25-29. Personnel involved were: Tom Bemis, Nate Skelton, Scott Maxwell, Pat Seiser and Stan Allison. John and Anmar pre-planned from the entrance to the bottom of Apricot Pit and the Great White Way far exceeding the park's expectations. The pre-plan ideology involved minimizing equipment and personnel needed to increase the speed and efficiency and efficacy of a rescue, but also to reduce the impact of a rescue on the cave itself. Many of the haul systems call for counter-balance systems which reduce the amount of equipment and personnel needed. The counter-balance haul system was tested on Boulder Falls and worked quite well. This haul system can be operated with minimal equipment and with as few as five people. A Power-Point program was developed as a part of the pre-plan.

## **Bosted-Lyles Expedition (West. Borehole)**

Peter Bosted and John Lyles co-led an expedition to the Western Borehole October 30 to November 6. The expedition had an international flavor with participants Daniel Chailloux from France, David Wools-Comb, Garry and Jenny Whitby from The Land Down Under. Matt Covington, Andy and Bonny Armstrong, Brian Kendrick, Jennifer Foote and Mark Andrich were also on the expedition. A total of 3,960 feet of new survey was accomplished with an additional 1,473 feet of resurvey done. Highlights of the trip include the discovery of about 700 feet of new cave to the south of Zanzibar in an area called the Zombie Zoo. Several leads were documented and surveyed in the Motherlode area including one called Anotherlode where the explorers ran out of rope in an unexplored, deep fissure with air. Work was also done in Paris, Texas and the Widowmaker area.

## **BBC Filming**

On October 9 and 10 Stan Allison led a crew from the BBC on a "recce" to plan for a high definition video project to take place in November. Huw Cordey (producer), Paul Stewart (cameraman) and Justin Anderson (researcher) spent one night at Big Sky camp and visited the Pearlsian Gulf, Chandelier Ballroom, Prickly Ice Cube Room, Hoodoo Hall and Land of Awes to prepare for the video project.

A cooperative high definition video project between the BBC and NPS supported by volunteer cavers took place from November 9-19. The video crew spent ten days in the Big Sky Camp videoing in the southwest branch. Support crews of cavers entered the cave each day bringing in video equipment, food, fresh batteries and video tapes and exited with spent batteries full tapes and etc. Video was obtained at Lake Chandalar, LaBarge Borehole, Yellow Brick Road, Land of Awes, Chandelier Ballroom, Prickly Ice-cube Room, Hoodoo Hall and the Dilithium Crystal Pool. The BBC will give all of the footage to the NPS and also is producing an hour long show on caves of where the Lechuguilla segment will appear. Look for the finished product to be aired in the spring of 2006.

Personnel on the trip were: Huw Cordey (producer), Paul Stewart (cameraman), Gavin Newman (lights and still images), Justin Anderson (researcher), Stan Allison (NPS representative). Much thanks goes to all of the support cavers who made this ambitious project possible: Pam and Tim Fogg, John Altingham, Andy Eavis, John Lyles, Bonny and Andy Armstrong, Mark Andrich, Gosia Allison-Kosior, Faith Watkins, Jean Krejca, Bev Shade,



## 2004 Lechuguilla Science Summary

*Paul Burger*

### Summary

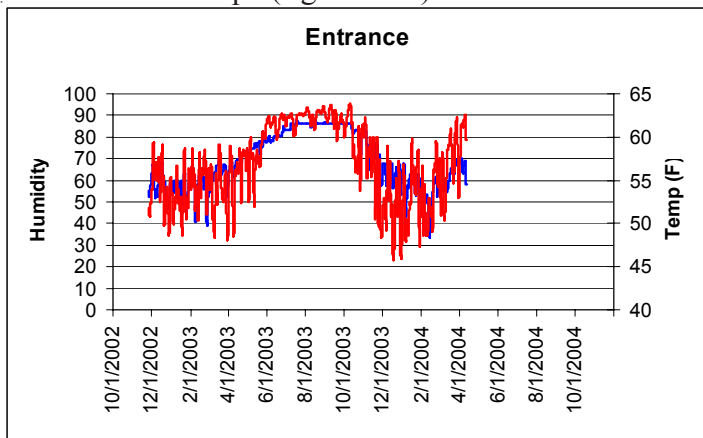
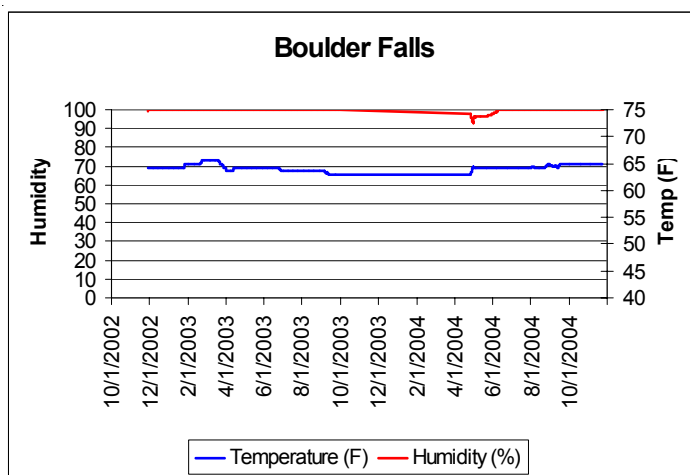
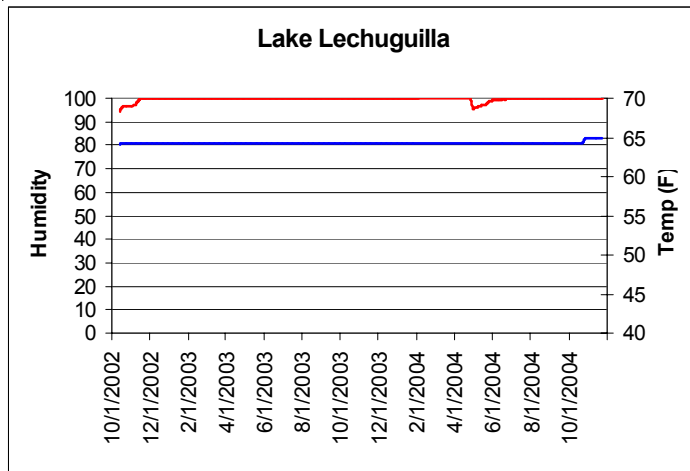
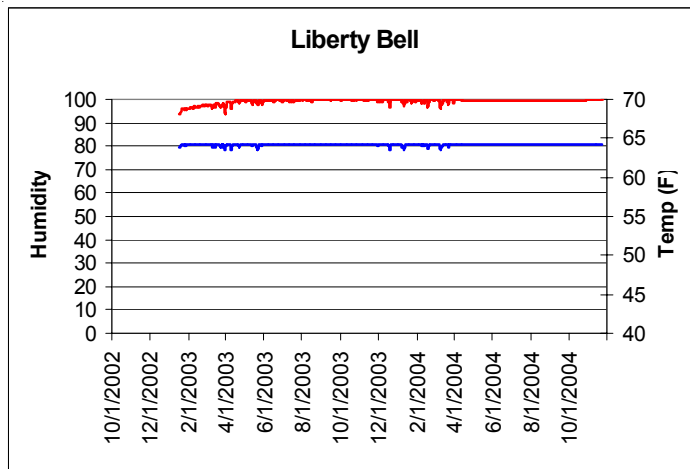
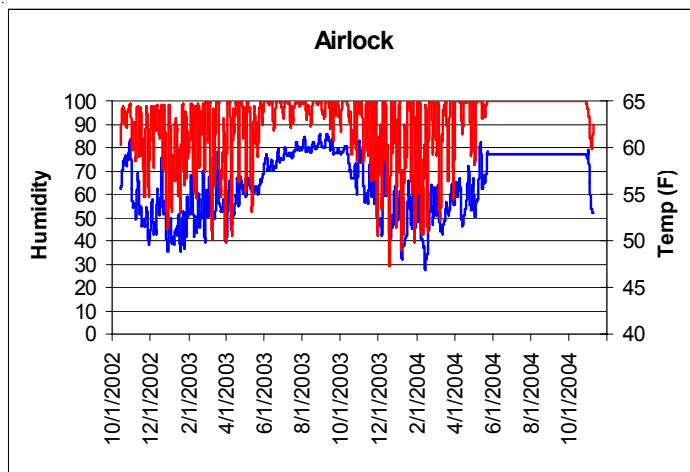
There have been fewer research trips into Lechuguilla this year than in past years. Many rock and glass slides are in or near pools to determine microbe growth and do not need to be sampled yet. There was one trip by Dr. Hazel Barton to examine the dots in the Pink Dot Pool. Most of the science trips in the cave focused on monitoring water levels at Lake of the White Roses and monitoring climate changes in the area from the entrance to Boulder Falls.

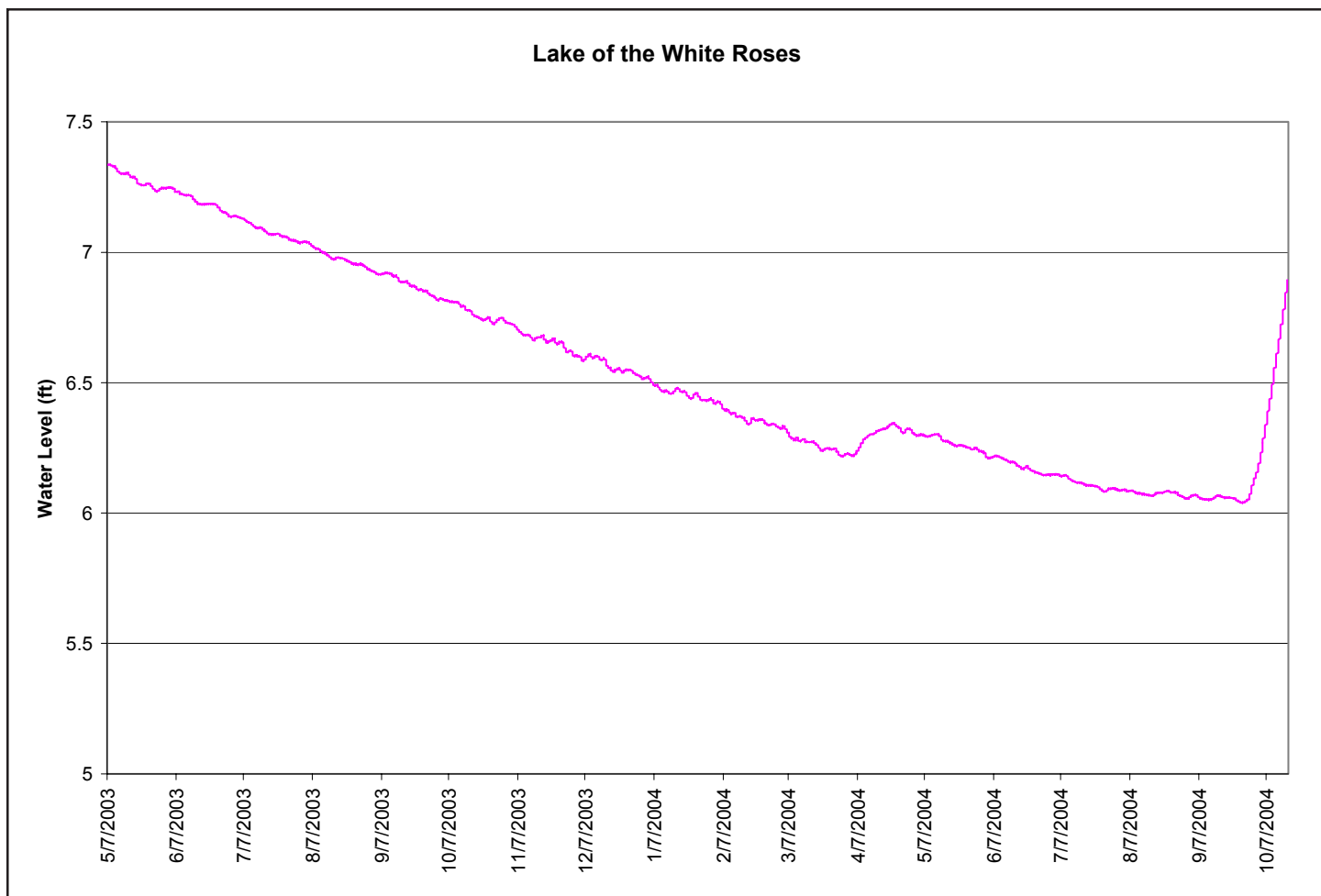
### Pink Dot Pool

Dr. Barton observed the growths in Pink Dot Pool during her May 10-16 survey expedition. She saw evidence that there were increased amounts of organic material in the area in the form of a brown residue along the edge of the water. The residue appears to be some kind of biofilm that may be breaking apart and forming the dots observed in the pool in the past. Further analysis is needed to determine if the dots are the same as the residue and if the increased organic load is related to the nearby Deep Seas Camp.

### Entrance Microclimate

The park has installed five temperature and humidity loggers between the entrance pit and the top of Boulder Falls. These loggers collect data in two-hour intervals and provide a detailed record of changes. The data show little to no change in temperature and humidity below the Flowstone Slope (figures 1-5).





## Lake of the White Roses

A water level logger was installed at Lake of the White Roses May 7, 2003 and was set to collect data every two hours (graph above). Geochemical, temperature, and other groundwater data suggest that Lake of the White Roses represents the groundwater table and that lake levels should reflect changes in the water table. The data show a steady decline in water levels until April, 2004 when there was a marked increase in rainfall in the park. The levels increased by 0.1 feet and then began to steadily decline. Water level then rose dramatically at the end of September in response to record rainfalls and increased more than 0.5 feet.

## Lake Lechuguilla

This year has seen more than 25 inches of rainfall in the park compared to an average around 10 inches since 1998. Heavy rainfall beginning in April has made the entrance area of Lechuguilla much wetter than it has been for more than a decade (graph on right). Water levels in Lake Lechuguilla are now higher than they have been since the first years of exploration. The park has installed a water level logger in the lake to monitor changes in lake level with precipitation.

## Red Lake Area Impact Studies

The final trip of the year took place from December 19-22. Jim Werker led Val Hildreth-Werker, Merideth Hildreth, Dennis Hoburg and Mike Spilde on a research trip to collect samples at the far end of the Western Borehole. Samples were collected for Dr. Penny Boston, Mr. Mike Spilde and Dr. Diana Northup.

